

transferred to *Larentia*), constitute a genus sister to *Cipura*. Rodriguez and Sytsma (2006), using both nuclear and chloroplast genes, likewise showed *Larentia* sister to *Cipura* (using *L. rosei* as *C. rosei* R. C. Foster), but their study did not include any true *Cypella* species; their analysis thus provides no evidence directly relevant to this discussion. *Larentia* now includes three species.

For the reasons outlined above, Goldblatt and Manning (2008) followed Ravenna in recognizing *Larentia*, pending a more extensive molecular systematic analysis of Tigridaeae. We therefore reduce *Zygella* to synonymy in *Larentia*. We also refer two species of *Zygella* to *L. linearis*. Until now it has not been clear in the literature that *L. linearis* occurs in Brazil, but apart from the collections included in the two species of *Zygella*, we have found specimens identified as *L. linearis* from Brazil, e.g., *Hatschbach* 33300 (MO) from Goiás, and several more. The Brazilian plants seem to us in no way different from those from Venezuela. Location of the type material of Hoehne's *Z. mooreana* remains problematic, as it has not been located at SP where expected. For this reason, we have chosen a lectotype for the species, the illustration accompanying the protologue.

**Larentia** Klatt, Abh. Naturf. Ges. Halle 15: 362. 1882. TYPE: *Larentia linearis* (Kunth) Klatt.

*Zygella* S. Moore, Trans. Linn. Soc. London, Bot., ser. 2, 4: 493. 1895, syn. nov. TYPE: *Zygella graminea* S. Moore (= *Larentia linearis* (Kunth) Klatt).

**Larentia linearis** (Kunth) Klatt, Abh. Naturf. Ges. Halle 15: 362. 1882. Basionym: *Moraea linearis* Kunth, in Humb., Bonpl. & Kunth, Nov. Gen. Sp. (quarto ed.) 1: 321. 1815 [1816]. TYPE: Venezuela. "Crescit in humidis calidisque Guayanae prope El Trapiche de Farreras," June, *Humboldt & Bonpland s.n.* (type, P).

*Zygella graminea* S. Moore, Trans. Linn. Soc. London, Bot., ser. 2, 4: 494. 1895, syn. nov. TYPE: Brazil. Mato Grosso: Santa Cruz, S. Moore 993 (holotype, BM).

*Zygella mooreana* Hoehne, Commiss. Linhas Telegr. Estratég. Matto Grosso Amazonas 1: 19. 1910, syn. nov.

TYPE: Brazil. Mato Grosso: Porto Esperidiao (lectotype, designated here, fig. 58 in Hoehne, 1910).

**Larentia mexicana** (C. V. Morton & R. C. Foster) Goldblatt, comb. nov. Basionym: *Cypella mexicana* C. V. Morton & R. C. Foster, Contr. Gray Herb. 171: 22. 1950. TYPE: Mexico. Guerrero: Montes de Oca, 15 June 1937, G. Hinton et al. 10322 (holotype, US; isotypes, GH, MO, NY).

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#### Literature Cited

- Baker, J. G. 1892. Handbook of the Iridaceae. George Bell, London.
- Foster, R. C. 1945. Studies in the Iridaceae, III. Contr. Gray Herb. 155: 3–54.
- Goldblatt, P. 1990. Phylogeny and classification of Iridaceae. Ann. Missouri Bot. Gard. 77: 607–627.
- & J. C. Manning. 2008. The *Iris* Family: Natural History and Classification. Timber Press, Portland.
- , A. Rodriguez, T. J. Davies, J. C. Manning, M. P. Powell, M. van der Bank & V. Savolainen. 2008. Iridaceae "Out of Australasia"? Phylogeny, biogeography, and divergence time based on plastid DNA sequences. Syst. Bot. 33: 495–508.
- Hoehne, F. C. 1910. Comissão de Linhas Telegraficas Estratégicas de Matto Grosso ao Amazonas. Annex no. 5, Historia natural. Botanica, Pt. 1. Rio de Janeiro.
- Klatt, F. W. 1882. Ergänzungen und Berichtigungen zu Baker's Systema Iridacearum. Abh. Naturf. Ges. Halle 15: 44–404.
- Moore, S. le M. 1895. The phanerogamic botany of the Matto Grosso Expedition, 1891–92. Trans. Linn. Soc. London, Bot. 4: 265–516.
- Ravenna, P. 1977. Notas sobre Iridaceae V. Notic. Mens. Mus. Nac. Hist. Nat. (Santiago) 21(249): 7–9.
- Rodriguez, A. & K. Sytsma. 2006. Phylogeny of the tiger-flower group (Tigridaeae: Iridaceae): Molecular and morphological evidence. Pp. 412–424 in J. T. Columbus, E. A. Friar, J. M. Porter, L. M. Prince & M. G. Simpson (editors), Monocots: Comparative Biology and Evolution, Vol. 1. Rancho Santa Ana Botanical Garden, Claremont, California.

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# A New Xeromorphic Species of *Clusia* (Clusiaceae) from Dry Valleys of Northern Peru

Mats H. G. Gustafsson

Ecoinformatics and Biodiversity, Department of Biological Sciences, Aarhus University, Ole Worms Allé, Building 1137, 8000 Århus C, Denmark. mats.gustafsson@biology.au.dk

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**ABSTRACT.** *Clusia magnoliiflora* M. H. G. Gust. is described as new for the Clusiaceae. It grows in dry scrub in the river valleys of the Marañón and its tributaries in northern Peru, a kind of habitat that harbors very few *Clusia* species. The species is distinct on account of its extremely thick, obovate leaves; the large, white flowers with as many as seven or eight spatulate petals; the large, white, triangular stigmata in the flower; and the spherical fruit with the stigmata positioned well below the apex. *Clusia magnoliiflora* is abundant in the habitat where it was collected.

**Key words:** *Clusia*, Clusiaceae, IUCN Red List, Marañón valley, Peru, Retinostemon group.

The Neotropical genus *Clusia* L. (Clusiaceae) comprises terrestrial, hemiepiphytic, and epilithic trees and shrubs. Most species are either hemiepiphytes in lowland rainforests or terrestrial trees or shrubs in wet montane forests, while only a few occur in arid areas. A distinctive species in the last category, found in dry valleys in northern Peru, is here described as new.

***Clusia magnoliiflora*** M. H. G. Gust., sp. nov. TYPE: Peru. Amazonas: Marañón valley, on rd. to Lonya Grande 35 km from main rd. Bagua Grande–Chamaya, 6°2.0'S, 78°36.5'W, 600 m, 9 July 2002, M. H. G. Gustafsson 544 (holotype, AAU; isotype, USM). Figures 1, 2.

A speciebus *Clusiae* L. notis foliis obovatis crassisimms, floribus grandibus petalis albis spatulatis usque ad 7 vel 8 et capsula sphaerica stigmatibus peltatis dissitis infra apicem positis distinguitur.

Dioecious shrub or tree to 4 m tall; latex yellow; branches terete, somewhat succulent, with constrictions at the nodes. Leaves obovate, to 2 mm thick, petiole 8–14 mm, lamina 55–115 × 25–46 mm, cuneate at base, venation often obscure but sometimes visible abaxially, of 6 to 8 secondary veins at an angle of ca. 20°–30°, sparsely branched distally; laticifers visible on fresh leaves or on young, dried leaves as ± straight, thin, dense lines (white when fresh, blackish

when dried) on adaxial surfaces, occasionally branched or anastomosing; angles very steep. Inflorescences of staminate plants 3- to 5-flowered, of pistillate plants 3-flowered; flowers to 9 cm diam., fragrant; bracteoles in 4 pairs, thick, decussate; sepals 5, orbicular, 12–16 mm, somewhat petaloid; petals 7 or 8, white, spatulate, concave, 26–38 × 17–25 mm, caducous in fruit; staminate flowers with a white, rounded to octagonal synandrium, 12–18 mm wide, covered with yellow resin at anthesis; anthers ca. 80 to 120, sessile, mostly dithecal, 1.5–2.5 × 1.5–2.5 mm, opening with 2 longitudinal slits; stigmata 9, white, irregularly triangular, 4–5 × 4–5 mm, peltate, on styles < 1 mm long; staminodial ring whitish, 1.5–3 mm tall, crowned by 12 to 16 resiniferous antherodes, ca. 1 × 2–3 mm. Fruit globular (immature fruit measured at 25 mm) with black, peltate, widely spaced stigmata, positioned well below the apex; petals caducous in fruit.

**Distribution and habitat.** *Clusia magnoliiflora* occurs in large populations in parts of the Chinchipe river valley and in adjacent parts of the Marañón river valley, where it grows in dry scrub at between 500 and 1200 m altitude (Fig. 2E, F). Other elements in this vegetation include cacti, such as species of *Melocactus* Link & Otto, and shrubs, such as *Croton* L.

**IUCN Red List category.** Given the large populations distributed over a relatively large area, the species appears not to be threatened and is assessed here as Least Concern (LC) according to IUCN Red List criteria (IUCN, 2001). Some of the localities are intensively grazed by goats, which certainly have a strong impact on the vegetation. This probably does not, however, negatively affect the stands of *Clusia magnoliiflora*, as the animals apparently avoid them.

**Etymology.** The specific epithet refers to the similarity of the flowers, when seen from a distance, to certain species of *Magnolia* L.

**Local names and uses.** According to residents of Lonya Grande (July 2002), the dried latex of *Clusia magnoliiflora* is used as incense in churches, and the

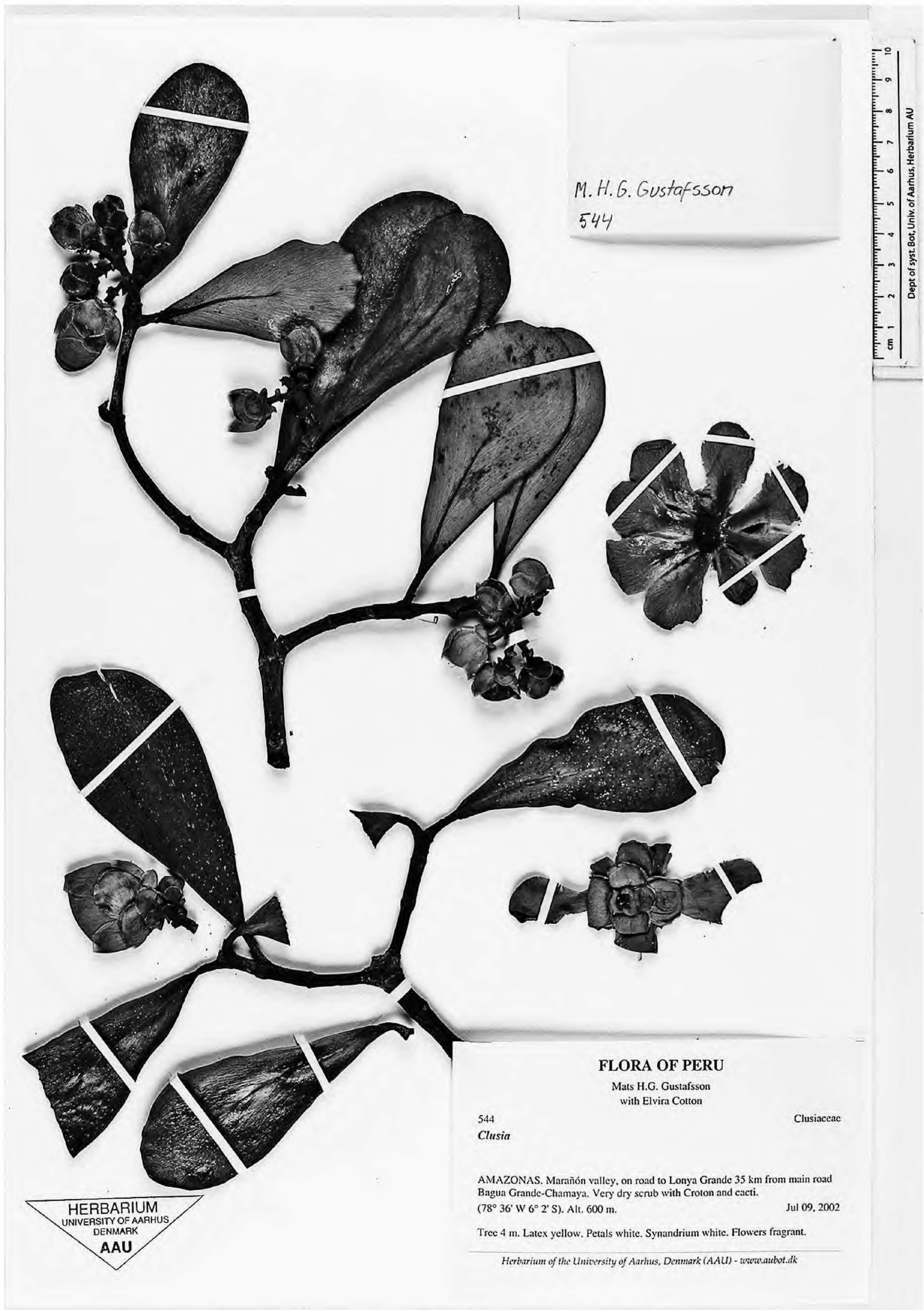


Figure 1. Type specimen of *Clusia magnoliiflora* M. H. G. Gust. (Gustafsson 544, AAU).

fruit is cut and applied to wounds to improve healing. The local name is “tola blanca.”

*Discussion.* *Clusia magnoliiflora* has exceptionally thick leaves, and its xerophytic character is also

evident in the  $^{13}\text{C}/^{12}\text{C}$  signature, which shows an extreme value for *Clusia* (K. Winter & M. H. G. Gustafsson, unpublished). This indicates pronounced crassulacean acid metabolism (CAM) photosynthesis, which in *Clusia* is otherwise seen predom-

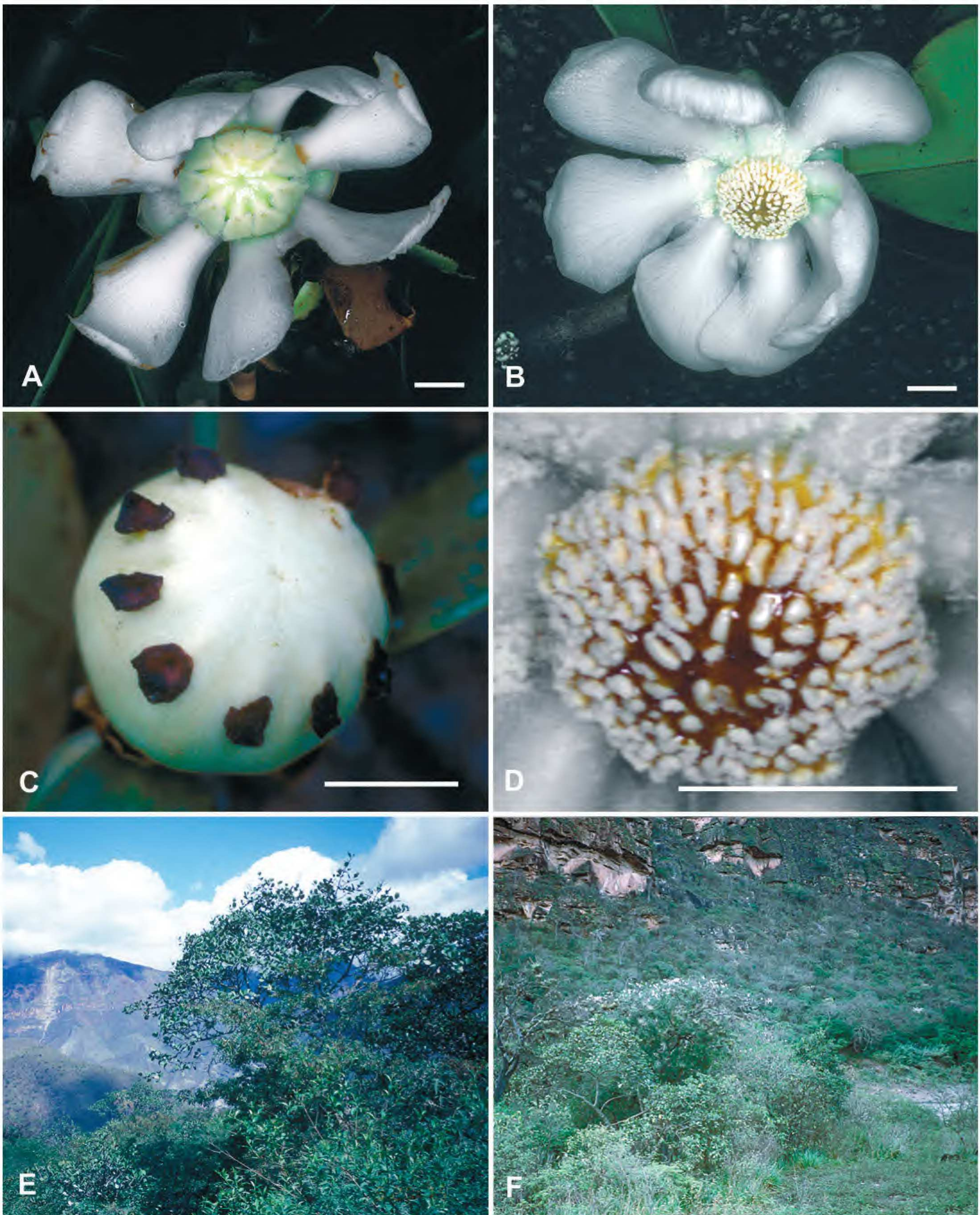


Figure 2. *Clusia magnoliiflora* M. H. G. Gust. —A. Pistillate flower from paratype (*Gustafsson 545*). —B. Staminate flower from holotype material (*Gustafsson 544*). —C. Fruit from specimen at the type locality. —D. Synandrium of holotype material (*Gustafsson 544*). —E, F. Plants in habitat. Scale bars = 10 mm. Photographs by M. H. G. Gustafsson.

inantly in species of lower altitudes (Holtum et al., 2004).

Highly characteristic for *Clusia magnoliiflora* are the large, white flowers with spatulate petals that do not overlap at the base (Fig. 2A, B). Furthermore, the arrangement of stigmata on the fruit is unique in that

they are very widely spaced and positioned well below the apex (Fig. 2C). Molecular data (ITS sequences of holotype; GenBank accession number HM120218; sequence manually fitted to the alignment used by Gustafsson & Bittrich [2003]; methods generally as described therein) show that the species belongs to the